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Technical Report 5-20066
Contract No. DAAH01-92-D-R006
Delivery Order No. 147

Systems Engineering Analysis of the
MPIM/SRAW Program

(5-20066)

Final Technical Report for Period
3 February 98 through 30 June 1998

August 1999

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Redstone Arsenal, AL 35898
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PREFACE

This technical report was prepared by the staff of the Research Institute, The University of Alabama in Huntsville. The purpose of this report is to provide documentation of the work performed and results obtained under Delivery Order 147 of AMCOM Contract No. DAAH01-92-D-R006. Mr. Robert Harvey and Mr. Gary Maddux were the principal investigators. Mr. George Wandler of UAH served as lead engineer. Mr. Doug Johnston, Industrial Operations Division, Systems Engineering and Production Directorate, Research, Development, and Engineering Center, U.S. Army Aviation & Missile Command, provided technical coordination.

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Prepared for: Commander
U.S. Army Aviation & Missile Command
Redstone Arsenal, AL 35898

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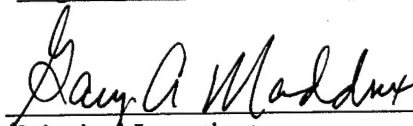

Principal Investigator

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1.0 Introduction

The Systems Engineering and Production Directorate (SEPD), Research, Development and Engineering Center (RDEC) at the U.S. Army Aviation and Missile Command (AMCOM) has an engineering support contract with the University of Alabama in Huntsville. The scope of this contract provides for activities in systems engineering and manufacturing technology. The Industrial Operations Division (IOD), SEPD has the mission and function of providing technical management and engineering analysis as they relate to AMCOM supported weapon systems. This management and engineering analysis ensures that weapon system design and programmatic changes are incorporated only after a systematic technical evaluation and review of the total impact of the change is conducted. This systems engineering analysis evaluates the long-term life cycle consequences of the change, to include impacts on the manufacturability, maintainability and supportability of the overall weapon system. In order to fulfill its mission, the IOD required support in analysis of the MPIM/SRAW Program.

2.0 Objective

The objective of this task was to provide system engineering and perform systems engineering analysis of the MPIM/SRAW Program and formulate recommendations that can be used to lower life cycle costs (LCC) and improve the maintainability and reliability of future systems.

3.0 Statement of Work

The statement of work, as outlined in delivery order 147, was as follows:

UAH shall analyze the availability of microelectronic parts used in the MPIM/SRAW weapon system. The analyses shall be for microelectronics specifically identified by the IOD. UAH shall assess the health of the present configuration in terms of availability, and recommend solutions to non-availability problems. Solutions shall be presented with sufficient documentation to justify design change considerations. UAH shall not only present solutions that are unique to MPIM/SRAW, but shall also utilize solutions that have been developed for other weapon systems within the Army and DoD when applicable. This analyses shall involve the use of government furnished databases and other automated tools such as the Enhanced Microcircuit Obsolescence Analysis Tool (E-MOAT), TACHTech, and IHS Caps Expert. Other sources of information from other project offices, other commands, and the electronics industry shall be used as required.

UAH shall provide system engineering and technical support to the MPIM/SRAW system engineer. UAH shall ensure that the progress reports are developed, tracked, and collected for all test activities. UAH shall assist the MPIM/SRAW

system engineer in coordinating and resolving system engineering problems associated with management of the MPIM/SRAW program.

UAH shall provide technical support in tracking the progress and monitoring problems associated with the MPIM/SRAW production facility transition from China Lake, CA to Troy, AL. UAH shall provide systems engineering analysis of potential manufacturing problems involved with setting up the new facility, and make recommendations as appropriate.

4.0 Assessment of the MPIM/SRAW System

Under this task members of the UAH Systems Management and Production Lab performed a detailed engineering analysis on the component parts of the MPIM/SRAW weapon system. Specifically, microelectronic components were analyzed according to their availability and expected life cycle. To ascertain this information, UAH worked with the electronics industry, the MPIM/SRAW Project Office, and other government agencies. UAH also worked closely with the MPIM/SRAW systems engineer to resolve design problems as they arose.

UAH provided technical support by monitoring the production problems reported during the MPIM/SRAW transition between facilities. The results of these task efforts were published and delivered to IOD under separate cover.

5.0 Conclusion and Recommendations

During the time frame allocated by the delivery order, members of the UAH Systems Management and Production Lab, with the cooperation of representatives from AMCOM Systems Engineering and Production Directorate and the MPIM/SRAW Project Office investigated the life cycle supportability of the microelectronics of the MPIM/SRAW weapon system. Because of the rapidly changing microelectronics industry, it is imperative that this assessment be refreshed on a periodic basis. Only through the diligent monitoring of a complex system can its sustainability issues be properly addressed. It is recommended that the MPIM/SRAW weapon system adopt a proactive obsolescence management philosophy so that the total cost of ownership is reduced over the system's life cycle.